

**Description****External operating unit for a mobile radio telephone**

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The invention relates to an operating unit for a mobile radio telephone, where the operating unit is constructed separately from the mobile radio telephone and can be connected to the mobile radio telephone. The invention also relates to a method for updating instruction functions of an external operating unit for operating a mobile radio telephone.

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From German Patent Application 99 21 533.2 of the applicant, which has not been previously published, a communication system of a motor vehicle is known which contains a mobile radio telephone and an audio and/or information system installed in a motor vehicle. The mobile radio telephone can be operated via the operating unit of the audio and/or information system so that a hands-free function can be implemented. In this arrangement, call transmission and/or data transmission between the mobile radio telephone and the audio and/or information system takes place via a wireless connection.

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From the journal ADAC Motorwelt, March 1999 edition, a Telematik Service Kit is known in which breakdown assistance can be requested, an emergency call sent out or traffic information requested via various keys via an additional device which can be connected to a mobile radio telephone. This additional device thus also represents an external operating unit for certain functions of a mobile radio telephone. As can be seen from this publication, the additional device can only be used with certain types of mobile

radio telephones. In particular, the problem arises that when a user of this Telematik Service Kit procures a new mobile radio telephone, he cannot continue to use the external operating unit already in existence since this is only equipped for operation with fixed types of mobile radio telephones.

In the meantime, mobile radio telephones are being offered via which Internet access is possible. The user thus has the capability of searching through the offers of the Internet and to download information from the Internet via the mobile radio telephone independently of a telephone land line. The Internet is accessed in accordance with the WAP (wireless application protocol) standard. The WAP is the common standard of the communications industry for transmitting specially prepared Internet pages to mobile radio telephones. Future mobile radio generations can also operate in accordance with the new UMTS (Universal Mobile Telecommunications System) standard. The UMTS is a mobile radio standard which provides for data transmission at up to 200-times the speed of the conventional networks.

It can be seen from the above description, that the further development of mobile radio telephones will lead to new generations of devices with an altered range of functions at short intervals even in the future. However, corresponding modern mobile radio telephones with expanded functionality cannot be combined with existing external operating units existing, in particular, in motor vehicles. This forms the basis for the present invention which has the object of specifying an operating device which can be adapted to the different functionalities of various mobile radio telephones in a simple manner.

The object is achieved by an operating unit for a mobile radio telephone, in which the operating unit is constructed separately from the mobile radio telephone and can be connected to the mobile radio telephone, a first set of standardized functions for

mobile radio telephones which contains the functions for setting up a fixed data link and for transmitting an identity attribute of the mobile radio telephone, is stored in a memory module of the operating unit outside the mobile radio telephone, a library containing a second set of specialized functions of the mobile radio telephone can be loaded into the operating unit and can be stored in the memory module of the operating unit.

Whereas known operating units are designed for operation with certain types of mobile radio telephones where the mobile radio telephones, naturally, can only be those which were already available on the market at the time of the sale of the operating unit, the operating unit according to the invention also guarantees operation with future mobile radio types. In a memory module of the operating unit, a first set of standardized functions for mobile radio telephones is stored which only comprises a few standard functions. This includes the functions for setting up a fixed data link and for transmitting an identity attribute of the mobile radio telephone. The identity attribute is an attribute which clearly identifies the type of the mobile radio telephone connected. This can be, for example, the precise type designation of the mobile radio telephone or also a code number. If then a new mobile radio telephone is connected to the operating unit, where the specialized functions of this new mobile radio telephone exceed the abovementioned basic functions, a library containing a second set of the specialized functions of the mobile radio telephone is loaded into the operating unit and stored in the memory module of the operating unit. The new mobile radio telephone can then be operated with all its functions via the external operating unit.

In particular, the operating unit has a control module with a program, which is generally called a browser, for accessing files of a generally accessible external computer system, especially the Internet, via a radio link of the mobile radio telephone. In this

arrangement, it is possible to access files of the Internet in a familiar manner via such a browser, the connection to an Internet provider being provided by a radio link of the mobile radio telephone. The consequence is that it becomes possible to load the second set of specialized functions from an external database and, in this case, especially via the Internet, by means of the radio link in a particularly simple manner. Corresponding information on the specialized functions can be made available for the customers in the Internet by the mobile radio manufacturers as is already the case today for other application programs such as, for example, printer drivers.

In principle, it is possible to integrate only the essential modules for the data transmission into the mobile radio telephone but the mobile radio telephone is preferably a mobile radio telephone which can be operated without the external operating unit. For this purpose, another display and operating unit is integrated into the mobile radio telephone. To this extent, this is a known, commercially available mobile radio telephone. In particular, the operating unit according to the invention for a mobile radio telephone can be permanently installed in a motor vehicle and can also be used as hands-free device in this arrangement.

In particular, the operating unit can be installed as an independent device in the motor vehicle, particularly in an indicating instrument of the vehicle or in the dashboard. In addition, the operating unit according to the invention can also be integrated in another component of the motor vehicle. This can be, in particular, a car radio, a navigation system or a multimedia system. Operating and display elements of these components can then also be used for the operating unit according to the invention, resulting in a cost advantage.

According to a further embodiment of the invention, the mobile radio telephone can also be

permanently installed in a motor vehicle where the operating unit can be, in particular, a mobile operating unit such as, for example, a notebook or a PDA (personal digital assistant).

5           The connection between the operating unit and the mobile radio telephone can be effected via a wire-connected link. However, a wireless link between the operating unit and the mobile radio telephone is particularly preferred, especially a wireless  
10 short-distance radio link as is described in the German Patent Application 199 21 533.2 initially mentioned, especially in accordance with the Bluetooth standard. The browser which is preferably present in the display unit is, in particular, a WAP browser. This provides  
15 Internet access by means of the operating unit via the WAP standard. The browser preferably uses the WML and WMLscript protocols or languages, respectively. These are standardized protocols and languages, respectively, which are analogous to the HTML and Java Script  
20 protocols and languages, respectively, present in Internet land line links. However, the invention is not restricted to the use of a WAP browser so that, in particular, future standards can also be used.

25           The aforementioned standardized basic functions which are permanently stored in the operating unit are, in particular, functions which are a component of the standardized AT+C instruction set.

30           A method according to the invention for updating instruction functions of an external operating unit for operating a mobile radio telephone, in which a first set of standardized functions which contains the functions for setting up a fixed data link and for transmitting an identity attribute of the mobile radio  
35 telephone is stored in a memory module associated with the operating unit, exhibits the following method steps:

- interrogating the identity attribute of the mobile radio telephone by means of a control module of the operating unit,

- determining, by means of the identity attribute, whether a second set of specialized functions of the mobile radio telephone is stored in the operating unit for the mobile radio telephone,
- 5 - if no second set of specialized functions is stored for the mobile radio telephone:
  - automatically establishing a radio link to an external database by means of the mobile radio telephone,
  - 10 - transmitting the identity attribute of the mobile radio telephone to the external database,
  - selecting the second set of specialized functions for the mobile radio telephone from the database,
  - transmitting the second set of specialized functions to the operating unit,
  - 15 - storing the second set of specialized functions outside the mobile radio telephone in the memory module associated with the operating unit.

In particular, storing the second set of specialized functions can be permanent. As an alternative, however, the second set of specialized functions can also be stored only temporarily so that it or parts thereof are always currently loaded via the mobile radio link. This ensures regular updating of the specialized functions and thus of the range of functions of the mobile radio telephone. If necessary, a reference to the functions which must always be currently loaded is stored.

In the text which follows, the invention will be explained in greater detail by means of an exemplary embodiment and with reference to the drawing, in which: Figure 1 shows a block diagram of the operating unit and of the mobile radio telephone, Figure 2 shows a flow chart.

Figure 1 shows a block diagram of the operating unit 1 which is connected to a mobile radio telephone 2. The operating unit 1 contains a control module 3 with a WAP browser. In this exemplary embodiment, the browser uses the WML and WMLscript protocols and

languages, respectively. The browser provides access to the Internet and data transmission from and to the Internet by means of a mobile radio link via the mobile radio telephone 2. For this purpose, a connection is established to an Internet provider in a known manner.

The control module 3 is connected to a memory module 4. A first set of standardized functions for mobile radio telephones is stored in the memory module 4. This first set of standardized functions is a part of the so-called AT+C instruction set. This set of standardized functions contains at least the functions for setting up a fixed data link and for transmitting an identity attribute of the mobile radio telephone. In addition, further specialized functions of the mobile radio telephone 2 are stored in the memory module. Thus, the full range of functions of the mobile radio telephone 2 can be used via the operating unit 1.

The control module 3 is also connected to a user interface 6. The user interface 6 contains an input unit and an output unit. The input unit can be, in particular, a keypad. The output unit is, in particular, a visual output unit. The input and output unit can be combined with one another, for example in the form of a touch screen. Thus, Internet pages can be called up with the aid of the browser in the control module 3 and the mobile radio telephone 2 and files can be downloaded from the Internet in a familiar manner via the user interface 6.

The operating unit 1 and the mobile radio telephone 2 are connected to one another via the link 5. The link 5 can be both a wire-connected link and a wireless link. If it is a wireless link, in particular, a short-distance radio link between the operating unit 1 and the mobile radio telephone 2 is preferred, for example in accordance with the Bluetooth standard. In this case, both the operating unit 1 and the mobile radio telephone 2 contain corresponding transceiver devices. Furthermore, the connection between the operating unit 1 and the mobile radio telephone 2 can

also be made via an optical link, especially an infrared link. In this case, corresponding infrared transceiver modules must be provided in the operating unit 1 and in the mobile radio telephone 2. In particular, the operating unit 1 can also have a number of the said possible links so that both a wire-connected link and a wireless link to corresponding mobile radio telephones is ensured.

If then a new mobile radio telephone is connected to the operating unit 1, for which the specialized functions have not yet been stored in the memory module 4 of the operating unit 1, the libraries needed are loaded into the memory module 4 from the Internet by means of a second set of specialized functions of the mobile radio telephone. The essential steps of the method executed during the process will be explained in the text which follows, referring to Figure 2.

After the devices have been switched on in step S1, the module designation of the connected mobile radio device is first interrogated by the control module 3 of the operating unit 1 in step S2. This can be, in particular, a coded model designation. In step S3, a check is made whether this is a known model, i.e. whether a library with specialized functions of the connected mobile radio telephone is stored in memory module 4. If this is so, the connection can be set up directly in step S4 and in step S5, the user can make his operating inputs. The actions associated with the operating inputs are executed in step S9. In step S10, a check is made whether the connection is to be terminated. If this is so, the connection is dropped in step S11. If not, new operating inputs can be made in step S5.

If it is found in step S3, in contrast, that no library of specialized functions is stored for the mobile radio telephone in memory module 4, a connection from the mobile radio telephone to an Internet provider will first be set up in step S6. This connection set up



is possible since the mobile radio telephone has at least a first set of standardized functions which is also stored in the memory module 4. These functions are the functions for setting up a fixed data link and for transmitting an identity attribute of the mobile radio telephone. The last-mentioned function has already been needed in step S2 for interrogating the model designation. In step S6, then, the Internet provider is accessed via the standardized function for setting up a fixed data link. In step S7, finally, a library containing a second step of specialized functions of the mobile radio telephone is loaded from the Internet. Step S7 comprises a number of substeps which, in particular, comprises the transmission of the identity attribute of the mobile radio telephone such as, for example, a coded model designation, to an Internet database, and a search for searching for the library belonging to this mobile radio telephone and containing a second set of specialized functions of the mobile radio telephone. After that, the selected library is transmitted to the operating unit 1. In step S8, the library thus loaded is stored in the memory module 4 of the operating unit 1. The memory module 4 contains corresponding memory elements which can be written to for this purpose. After that, the usual operating inputs can be made in a familiar manner in step S5. After this process, the specialized functions of this mobile radio telephone are now located in the operating unit 1, so that the process described of loading the library is only required when a new mobile radio type is connected to the operating unit 1 for the first time.

The operating unit according to the invention and the method according to the invention, respectively, thus open the possibility of also using an existing operating unit, especially an operating unit for mobile radio telephones arranged in a vehicle, with mobile radio telephones with new specialized functions which has newly come on the market.